

What is claimed is:

1           1.    A method for simulating an engine failure in a  
2   multiple-engine aircraft comprising the steps of:

3                reducing the power output of a first engine to simulate  
4   the engine failure; and

5                increasing the power output of at least a second engine  
6   to compensate for the reduction of the power output of the  
7   first engine.

1           2.    The method of claim 1 wherein the aircraft has more  
2   than two engines.

1           3.    The method of claim 1 wherein the aircraft is a  
2   helicopter.

1           4.    The method of claim 1 further comprising the step of  
2   checking one or more aircraft safety systems before starting  
3   the simulation.

1           5.    The method of claim 1 further comprising the steps  
2   of:

3                limiting the total power output of the aircraft to the  
4   maximum power output of the engines which are not simulating  
5   the engine failure;

6                limiting the power output level of each engine which is  
7   not simulating the engine failure to a level at or below the  
8   level at which engine damage will occur; and

9                limiting the total power output of the engines which are  
10   simulating the engine failure to a level at or below the total  
11   power output of the aircraft minus the total power output of  
12   the engines which are not simulating the engine failure.

1        6.    The method of claim 1 further comprising the step of  
2    monitoring one or more aircraft systems and returning the  
3    aircraft to normal operation whenever a fault is detected in  
4    any monitored system.

1        7.    A method for simulating an engine failure in a  
2    multiple-engine aircraft comprising the steps of:

3        reducing the power output of a first engine to simulate  
4    the engine failure;

5        increasing the power output of at least a second engine  
6    to a power level sufficient to permit aircraft flight without  
7    significant damage to any engine; and

8        displaying fictional engine condition data indicating  
9    that the power output of the first engine is substantially  
10   zero and that the power output of the second engine is higher  
11   than the true power output.

1        8.    The method of claim 7 wherein the fictional engine  
2    condition data is displayed on a flat panel display.

1        9.    The method of claim 7 wherein accurate engine  
2    condition data is provided to the pilot in combination with  
3    the fictional engine condition data.

1        10.   The method of claim 7 wherein the pilot is alerted  
2    any time the fictional power output of any engine exceeds the  
3    maximum power output attainable without engine damage.

1        11. The method of claim 7 wherein the fictional engine  
2 condition data is provided to the pilot in the form of needle  
3 type gauges in combination with digital readouts.

1        12. A computer program for simulating an engine failure  
2 in a multiple-engine aircraft comprising:

3        a code segment for reducing the power output of at least  
4 one engine to simulate the engine failure; and

5        a code segment for increasing the power output of at  
6 least a second engine to a power level sufficient to permit  
7 aircraft flight without significant damage to any engine.

1        13. The computer program of claim 12 wherein the  
2 aircraft has more than two engines.

1        14. The computer program of claim 12 wherein the  
2 aircraft is a helicopter.

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1 15. The computer program of claim 12 further comprising:

2 a code segment for limiting the total power output of the  
3 aircraft to the maximum power output of the engines which are  
4 not simulating the engine failure;

5 a code segment for limiting the power output level of  
6 each engine which does not have a simulated engine failure to  
7 a level at or below the level at which engine damage will  
8 occur; and

9 a code segment for limiting the total power output of the  
10 engines which do have a simulated engine failure to a level at  
11 or below the total power output of the aircraft minus the  
12 total power output of the engines which are not simulating the  
13 engine failure.

1 16. The computer program of claim 12 further comprising  
2 the step of monitoring one or more aircraft systems and  
3 returning the aircraft to normal operation whenever a fault is  
4 detected in any monitored system.

1 17. A computer program for simulating engine failure in  
2 a multiple-engine aircraft comprising:

3 a code segment for reducing the power output of an engine  
4 having a simulated engine failure;

5 a code segment for increasing the power output of a  
6 second engine to a power level sufficient to permit aircraft  
7 flight without significant damage to any engine; and

8 a code segment for displaying fictional engine condition  
9 data indicating that the power output of the simulated failed  
10 engine is zero and that the power output of at least one of  
11 the remaining engines is higher than the true value.

1 18. The computer program of claim 17 wherein the  
2 fictional engine condition data is displayed on a flat panel  
3 display.

1 19. The computer program of claim 17 wherein accurate  
2 engine condition data is provided to the pilot in combination  
3 with the fictional engine condition data.

4 20. The computer program of claim 17 wherein the pilot  
5 is alerted any time the fictional power output of any engine  
6 exceeds the maximum power output attainable without engine  
7 damage.

1 21. The computer program of claim 17 wherein the  
2 aircraft system condition data is provided to the pilot in the  
3 form of needle type gauges in combination with digital  
4 readouts.

1 22. A multiple-engine aircraft comprising:

2 a first engine;

3 a second engine;

4 a software component for reducing the power output of a  
5 first engine to simulate engine failure; and

6 a software component for increasing the power output of  
7 the second engine to compensate for the reduction of the power  
8 output of the first engine.

1 23. The aircraft of claim 22 wherein the aircraft  
2 further comprising a third engine.

1 24. The aircraft of claim 22 wherein the aircraft is a  
2 helicopter.

1        25. The aircraft of claim 22 further comprising a  
2 software component for checking one or more aircraft safety  
3 systems before reducing the power to any engine.

1        26. The aircraft of claim 22 further comprising:

2        a software component for limiting the total power output  
3 of the aircraft to the maximum power output of the engines  
4 which are not simulating the engine failure;

5        a software component for limiting the power output level  
6 of each engine which is not simulating the engine failure to a  
7 level at or below the level at which engine damage will occur;  
8 and

9        a software component for limiting the total power output  
10 of the engines which are simulating the engine failure to a  
11 level at or below the total power output of the aircraft minus  
12 the total power output of the engines which are not simulating  
13 the engine failure.

15       27. The aircraft of claim 22 further comprising a  
software component for monitoring one or more aircraft systems  
and returning the aircraft to normal operation whenever a  
fault is detected in any monitored system.